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1 A model of OASIS role-based access control and its support for active security

Jean Bacon, Ken Moody, Walt Yao

November 2002 **ACM Transactions on Information and System Security (TISSEC)**, Volume 5 Issue 4Full text available: [pdf\(352.06 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

OASIS is a role-based access control architecture for achieving secure interoperation of services in an open, distributed environment. The aim of OASIS is to allow autonomous management domains to specify their own access control policies and to interoperate subject to service level agreements (SLAs). Services define roles and implement formally specified policy to control role activation and service use; users must present the required credentials, in an appropriate context, in order to activate ...

Keywords: Certificates, OASIS, RBAC, distributed systems, policy, role-based access control, service-level agreements

2 Proposed NIST standard for role-based access control

David F. Ferraiolo, Ravi Sandhu, Serban Gavrila, D. Richard Kuhn, Ramaswamy Chandramouli

August 2001 **ACM Transactions on Information and System Security (TISSEC)**, Volume 4 Issue 3Full text available: [pdf\(417.90 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In this article we propose a standard for role-based access control (RBAC). Although RBAC models have received broad support as a generalized approach to access control, and are well recognized for their many advantages in performing large-scale authorization management, no single authoritative definition of RBAC exists today. This lack of a widely accepted model results in uncertainty and confusion about RBAC's utility and meaning. The

standard proposed here seeks to resolve this situation by u ...

Keywords: Role-based access control, access control, authorization management, security, standards

3 TRBAC: A temporal role-based access control model

Elisa Bertino, Piero Andrea Bonatti, Elena Ferrari

August 2001 **ACM Transactions on Information and System Security (TISSEC)**, Volume 4
Issue 3

Full text available:  [pdf\(355.35 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Role-based access control (RBAC) models are receiving increasing attention as a generalized approach to access control. Roles may be available to users at certain time periods, and unavailable at others. Moreover, there can be temporal dependencies among roles. To tackle such dynamic aspects, we introduce Temporal-RBAC (TRBAC), an extension of the RBAC model. TRBAC supports periodic role enabling and disabling---possibly with individual exceptions for particular users---and temporal dependencies ...

Keywords: Role triggers, role-based access control, temporal constraints

4 Role-based access control on the web

February 2001 **ACM Transactions on Information and System Security (TISSEC)**, Volume 4
Issue 1

Full text available:  [pdf\(331.03 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Current approaches to access control on the Web servers do not scale to enterprise-wide systems because they are mostly based on individual user identities. Hence we were motivated by the need to manage and enforce the strong and efficient RBAC access control technology in large-scale Web environments. To satisfy this requirement, we identify two different architectures for RBAC on the Web, called user-pull and server-pull. To demonstrate feasibility, we im ...

Keywords: WWW security, cookies, digital certificates, role-based access control

5 The role-based access control system of a European bank: a case study and discussion

Andreas Schaad, Jonathan Moffett, Jeremy Jacob

May 2001 **Proceedings of the sixth ACM symposium on Access control models and technologies**

Full text available:  [pdf\(201.08 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Research in the area of role-based access control has made fast progress over the last few

years. However, little has been done to identify and describe existing role-based access control systems within large organisations. This paper describes the access control system of a major European Bank. An overview of the systems structure, its administration and existing control principles constraining the administration is given. In addition, we provide an answer to a key question - the ratio of ...

Keywords: control principles, dual control, inheritance, least privilege, number of roles, role administration, role-based access control, separation of duties

6 A role-based access control model and reference implementation within a corporate intranet

David F. Ferraiolo, John F. Barkley, D. Richard Kuhn

February 1999 **ACM Transactions on Information and System Security (TISSEC)**, Volume 2 Issue 1

Full text available:  pdf(252.60 KB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


This paper describes NIST's enhanced RBAC model and our approach to designing and implementing RBAC features for networked Web servers. The RBAC model formalized in this paper is based on the properties that were first described in Ferraiolo and Kuhn [1992] and Ferraiolo et al. [1995], with adjustments resulting from experience gained by prototype implementations, market analysis, and observations made by Jansen [1988] and Hoffman [1996]. The implementation of RBAC for the Web (RBAC/Web) p ...

Keywords: RBAC, Web servers, World Wide Web, access control, authorization management, role based access

7 Team-and-role-based organizational context and access control for cooperative hypermedia environments

Weigang Wang

February 1999 **Proceedings of the tenth ACM Conference on Hypertext and hypermedia : returning to our diverse roots: returning to our diverse roots**

Full text available:  pdf(2.13 MB)

Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: cooperative hypermedia, coordination, groupware, process support, role-based access control, workflow

8 Constraints: Specifying and enforcing constraints in role-based access control

Jason Crampton

June 2003 **Proceedings of the eighth ACM symposium on Access control models and technologies**

Full text available:  pdf(185.63 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Constraints in access control in general and separation of duty constraints in particular are an important area of research. There are two important issues relating to constraints: their specification and their enforcement. We believe that existing separation of duty specification schemes are rather complicated and that the few enforcement models that exist are unlikely to scale well. We examine the assumptions behind existing approaches to separation of duty and present a combined specification ...

Keywords: authorization constraint, enforcement context, role-based access control, separation of duty constraint

9 Enterprise Role Administration: An administration concept for the enterprise role-based access control model

Axel Kern, Andreas Schaad, Jonathan Moffett

June 2003 **Proceedings of the eighth ACM symposium on Access control models and technologies**

Full text available:  pdf(206.66 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Using an underlying role-based model for the administration of roles has proved itself to be a successful approach. This paper sets out to describe the enterprise role-based access control model (ERBAC) in the context of SAM Jupiter, a commercial enterprise security management software. We provide an overview of the role-based conceptual model underlying SAM Jupiter. Having established this basis, we describe how the model is used to facilitate a role-based administration approach. In particular, ...

Keywords: SAM Jupiter, administrative role-based access control (ARBAC), automated identity management, enterprise role-based access control (ERBAC), enterprise roles, role-based access control (RBAC), scopes, security administration, security provisioning

10 Access Control Policies and Specifications: A lightweight approach to specification and analysis of role-based access control extensions

Andreas Schaad, Jonathan D. Moffett

June 2002 **Proceedings of the seventh ACM symposium on Access control models and technologies**

Full text available:  pdf(444.67 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Role-based access control is a powerful and policy-neutral concept for enforcing access control. Many extensions have been proposed, the most significant of which are the decentralised administration of role-based systems and the enforcement of constraints. However, the simultaneous integration of these extensions can cause conflicts in a later system implementation. We demonstrate how we use the Alloy language for the specification of a conflict-free role-based system. This specification provid ...

Keywords: ARBAC97, alloy, separation of duties

11 Role-based access control and the access control matrix

G. Saunders, M. Hitchens, V. Varadharajan

October 2001 **ACM SIGOPS Operating Systems Review**, Volume 35 Issue 4Full text available:  [pdf\(888.27 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)


The Access Matrix is a useful model for understanding the behaviour and properties of access control systems. While the matrix is rarely implemented, access control in real systems is usually based on access control mechanisms, such as access control lists or capabilities, that have clear relationships with the matrix model. In recent times a great deal of interest has been shown in Role Based Access Control (RBAC) models. However, the relationship between RBAC models and the Access Matrix is no ...

12 An argument for the role-based access control model

David F. Ferraiolo

May 2001 **Proceedings of the sixth ACM symposium on Access control models and technologies**Full text available:  [pdf\(171.06 KB\)](#) Additional Information: [full citation](#), [citations](#), [index terms](#)**13 A model of OASIS role-based access control and its support for active security**

Walt Yao, Ken Moody, Jean Bacon


May 2001 **Proceedings of the sixth ACM symposium on Access control models and technologies**Full text available:  [pdf\(220.27 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

OASIS is a role-based access control architecture for achieving secure interoperation of services in an open, distributed environment. Services define roles and implement formally specified policy for role activation and service use; users must present the required credentials, in the specified context, in order to activate a role or invoke a service. Roles are activated for the duration of a session only. In addition, a role is deactivated immediately if any of the conditions of the membe ...

Keywords: OASIS, RBAC, certificates, policy, role based access control, service level agreements

14 Configuring role-based access control to enforce mandatory and discretionary access control policies

Sylvia Osborn, Ravi Sandhu, Qamar Munawer

May 2000 **ACM Transactions on Information and System Security (TISSEC)**, Volume 3 Issue 2Full text available:  [pdf\(137.62 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Access control models have traditionally included mandatory access control (or lattice-

based access control) and discretionary access control. Subsequently, role-based access control has been introduced, along with claims that its mechanisms are general enough to simulate the traditional methods. In this paper we provide systematic constructions for various common forms of both of the traditional access control paradigms using the role-based access control (RBAC) models of Sandhu et al., co ...

Keywords: discretionary access control, lattice-based access control, mandatory access control, role-based access control

15 Role delegation in role-based access control

SangYeob Na, SuhHyun Cheon

July 2000 **Proceedings of the fifth ACM workshop on Role-based access control**

Full text available:  [pdf\(105.05 KB\)](#) Additional Information: [full citation](#), [references](#), [index terms](#)

Keywords: active delegation, delegation protocol, delegation server, passive delegation, role delegation, role-based access control

16 Supporting relationships in access control using role based access control

John Barkley, Konstantin Beznosov, Jinny Uppal

October 1999 **Proceedings of the fourth ACM workshop on Role-based access control**

Full text available:  [pdf\(1.19 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

17 A framework for implementing role-based access control using CORBA security service

Konstantin Beznosov, Yi Deng

October 1999 **Proceedings of the fourth ACM workshop on Role-based access control**

Full text available:  [pdf\(1.21 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

18 Context sensitivity in role-based access control

Arun Kumar, Neeran Karnik, Girish Chafle

July 2002 **ACM SIGOPS Operating Systems Review**, Volume 36 Issue 3

Full text available:  [pdf\(886.37 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#)

This paper describes an extended role-based access control (RBAC) model, which makes RBAC sensitive to the *context* of an attempted operation. Traditional RBAC does not specify whether the permissions associated with a role enable access to a *particular* object, or to some *subset* of objects belonging to a class. We extend the model by introducing the notions of role context and context filters. Context filters are Boolean expressions based on

the context of the user attempting ...

19 Team-based access control (TMAC): a primitive for applying role-based access controls in collaborative environments

Roshan K. Thomas

November 1997 **Proceedings of the second ACM workshop on Role-based access control**

Full text available:  [pdf\(745.93 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

20 RBAC for Collaborative Environments: Role-based access control for collaborative enterprise in peer-to-peer computing environments

Joon S. Park, Junseok Hwang

June 2003 **Proceedings of the eighth ACM symposium on Access control models and technologies**

Full text available:  [pdf\(324.70 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

In Peer-to-Peer (P2P) computing environments, each participant (peer) acts as both client and content provider. This satisfies the requirement that resources should be increasingly made available by being published to other users from a user's machine. Compared with services performed by the client-server model, P2P-based services have several advantages. However, wide-scale application of P2P computing is constrained by limitations associated with the especially sophisticated control mechanisms ...

Keywords: peer-to-peer computing, role-based access control, security

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